



Aerial view of the Naval Health Research Center, located in Point Loma, San Diego, California. (Courtesy photo)

A LOOK INSIDE: NAVY MEDICINE'S WEST COAST RESEARCH LAB, NAVAL HEALTH RESEARCH CENTER

In June, 1959, the U.S. Navy's Bureau of Medicine and Surgery (BUMED) established the Navy Medical Neuropsychiatric Research Unit. In September 1974, the unit's name changed to the Naval Health Research Center (NHRC).

Today, NHRC's mission is to optimize operational readiness and warfighter health by informing DoD policy through research. Located aboard Naval Base Point Loma, NHRC is the Department of Defense's designated Deployment Health Research Center and the only military medical research center on the West Coast.

Researchers at NHRC have diverse professional backgrounds that includes expertise in microbiology, aerospace physiology, data science, epidemiology, physical therapy, software and hardware engineering, neuroscience, preventive medicine, and biomedical engineering.

Scientific activities at NHRC are divided into three core areas, each with research portfolios that focus on crucial aspects of warfighter health and readiness:

- Military Population Health
- Operational Infectious Diseases
- Operational Readiness and Health

NHRC's research covers a lot of ground—everything from human performance to deployment health and infectious diseases—but no matter how diverse these studies seem, they all have one thing in common. Readiness.

“Readiness is why we exist. Every study is designed to improve military readiness, enhance force health protection, and prevent injury and illness. Whether we’re conducting research to improve survivability, build resilience, or optimize human performance, readiness is what we do.”

Capt. Marshall Monteville, Commanding Officer, Naval Health Research Center

Readiness

NHRC's Operational Health and Readiness Directorate studies multiple aspects of human performance, resilience and injury prevention to improve the health and readiness of warfighters. Current research efforts include:

- Environmental physiology. Researchers examine the physiological impact of extreme environmental conditions to keep warfighters healthy and mission-ready.
- Physical readiness and resilience. Researchers investigate strategies to improve physical and cognitive performance, build resilience, and enhance overall readiness.
- Fatigue and sleep. Researchers study the impact of sleep loss and fatigue on warfighter performance and develop interventions to reduce their impact.
- Injury prevention and rehabilitation. Researchers investigate factors that contribute to and reduce physical and cognitive injuries.

These studies are supported by NHRC's Warfighter Performance Laboratory, a 6,000-square foot human performance laboratory with high-tech tools and research capabilities, including the Physical and Cognitive Research Environment (PhyCORE), the Sleep and Fatigue Lab, and the Environmental Physiology Lab.

PhyCORE

Researchers create immersive virtual reality environments to maximize user engagement for studies that focuses on maximizing operational readiness or improving rehabilitation. This is done with the Computer Assisted Rehabilitation Environment (CAREN), an immersive virtual reality system with visual, auditory, vestibular, and tactile sensory inputs. Features include:

- A 9-foot diameter platform, programmable to move in six degrees of freedom, independently or simultaneously
- A treadmill centered in the platform with integrated force plates to measure ground reaction forces

- A 180-degree wide, 9-foot tall curved screen surrounding the platform
- Motion capture cameras integrated with the screen to track user movement

Sleep and Fatigue Lab

- A 2-bedroom sleep laboratory
- Sleep monitoring using gold standard and innovative technologies
- Sleep disorder diagnostics

Environmental Physiology Lab

NHRC's environmental chamber, one of six configured for human use research within the DoD, allows researchers to replicate environmental conditions, such as those found on a ship, create anticipated workloads, and conduct research in a controlled environment. The chamber, which is 20-feet wide by 29-feet long and is the newest in DoD, has the following capabilities:

- A temperature range of -23 °F to 130 °F
- A humidity range of 15–90%
- Wind speeds of 0.5–5.0 mph
- Two, 4-person treadmills (5-foot wide by 9-foot long)
- Laser rifle shooting system with reaction time capability



The Naval Health Research Center (NHRC) conducts research in support of operational readiness and warfighter health using the Computer Assisted Rehabilitation Environment (CAREN), an immersive virtual reality system. The CAREN is made up of a 9-foot diameter platform with integrated treadmill and 180-degree wide, 9-foot tall curved projection screen. The CAREN is used for studies related to survivability, equipment loads, rehabilitation, and fatigue. (U.S. Navy photo by Regena Kowitz/Released)





The Naval Health Research Center (NHRC) conducts thermal research using a state-of-the-science environmental chamber. Our current chamber, which is 20-feet wide by 29-feet long, was installed in 2010 and is the newest in the Department of Defense. (U.S. Navy photo by Regena Kowitz/Released)

Prevention

Deployment health researchers in NHRC's Military Population Health Directorate lead many epidemiological and behavioral health studies that aim to keep warfighters and their families healthy.

These longitudinal studies include:

The Millennium Cohort Program

- The largest prospective health study in DoD history
- Investigating how military occupational exposures, including those encountered during deployments, affect the long-term health of service members.
- A study following service members and veterans over the course of their lifetimes, providing critical information to increase understanding of how military service impacts health.

Millennium Cohort Family Program

- The first longitudinal study to follow a group of military spouses and assess long-term effects of military service and deployment on family health.
- Researchers investigate how military life experiences impact family members and how this dynamic plays a role in the health and readiness of service members.

Reproductive Health Research

- Researchers evaluate reproductive health outcomes in relation to specific military exposures such as vaccines and those related to deployment, occupation, or geographic location.
- Initially developed to monitor birth defects, the program has expanded to conduct regular surveillance of births to military members and their immediate families and ongoing research to understand how military service affects reproductive health.

The Recruit Assessment Program

- By collecting pre-service, baseline physical and mental health data from new military recruits, researchers develop a better understanding of how different military-specific factors, as well as pre-existing conditions, can impact retention and readiness.
- Research findings inform early intervention and prevention programs to protect health and readiness.



Jay Heaney, left, environmental physiologist at the Naval Health Research Center, adjusts heat stress testing equipment during data collection aboard USS Nimitz. (U.S. Navy photo by MCSN Jose Madrigal/Released)

Force Health Protection

Infectious diseases can spread like wildfire, causing illness or death for individuals or entire units. In fact, before World War II, more warfighters were lost to disease than combat. But researchers, armed with science, have turned the tide on this battle.

NHRC's surveillance for emerging infectious diseases is critical to force health protection. With a Navy and Marine Corps team that operates globally, warfighters conduct missions in areas of the world where they may be exposed to endemic infectious diseases. Many Sailors and Marines also live in close quarters—in barracks and shipboard berthing spaces—making them vulnerable to contagious illnesses, like influenza and norovirus.

Scientists within NHRC's Operational Infectious Diseases directorate continually monitor military populations for the presence of infectious diseases, acting as an early-warning system for dangerous pathogens and potential pandemics. When a potential disease threat is found, NHRC alerts military and civilian medical communities so they can take action to prevent or contain outbreaks of dangerous illnesses.

In an operational environment, disease outbreaks can compromise the mission. The job of researchers at NHRC is to see that it doesn't.

“One of the best things about being a Navy Medicine researcher is knowing the work we are doing has a direct and positive impact on our Sailors and Marines. Our work isn't theoretical, it's practical. The work we do in the lab ensures the health and readiness of our warfighters on the battlefield, whether that's at sea, on land, or undersea.”

Capt. Marshall Monteville, Commanding Officer, Naval Health Research Center



*Researchers at the Naval Health Research Center conduct surveillance for emerging infectious diseases.
(U.S. Navy photo by Regena Kowitz/Released)*